

# United States Patent [19]

Hama et al.

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[54] PLASMA PROCESS APPARATUS

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[\*] Notice: The term of this patent shall not extend  
beyond the expiration date of Pat. No.  
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[57] ABSTRACT

A plasma CVD apparatus for forming a silicon film on an LCD substrate includes a container which is divided into process and upper chambers by a quartz partition plate. A work table on which the substrate is mounted is arranged in the process chamber and a lower electrode to which a high frequency potential is applied is arranged in the work table. First lower and second upper supply heads are arranged between the partition plate and the work table in the process chamber.  $\text{SiH}_4$  and  $\text{H}_2$  gas and He gases are supplied through the first and second supply heads. He gas is transformed into plasma while  $\text{SiH}_4$  and  $\text{H}_2$  gas is excited and decomposed by the plasma thus formed. Two coils are arranged in the upper chamber and high frequency voltages are applied to the coils to generate electromagnetic field to induce the transforming of He gas into plasma. High frequency voltages applied to the coils are the same in phase and directions of current flowing through adjacent portions of the coils are the same.

16 Claims, 10 Drawing Sheets

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